

Attorney Docket No. 82274.472023  
Customer No. 24347

AMENDMENT AND RESPONSE  
SERIAL NO. 09/753,944

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REMARKS

The Office Action mailed October 7, 2002 has been carefully reviewed, and pursuant thereto, Applicant has cancelled pending claims 1-9, 11-17, and 20-24, and 43-48 and provided new claims 49-68 for clarity and ease of examination. Applicant respectfully submits that the amendments to the claims, and newly-added claims, are proper, do not constitute new matter, and will not create an additional burden on the Examiner. The newly-added claims are merely to make more explicit that which was implicit, inherent or intrinsic from an overall view of the claims as originally submitted. Therefore, it is respectfully requested that the newly-added claims be entered.

Applicant notes that the Examiner objected to the numbering of newly-added claims in the previous Office Action. Misnumbered claims 32-37, which were renumbered 43-48 by the Examiner, have been cancelled by the Applicant obviating Examiner's objection to these claims.

In the Office Action mailed October 7, 2002, the Examiner rejected claims 17, 20-22 and 24 under 35 USC § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Applicant has cancelled claims 17, 20-22 and 24 obviating Examiner's rejection of these claims based on 35 USC § 112.

**CLAIMS REJECTION UNDER 35 USC § 102**

In the Office Action mailed October 7, 2002, the Examiner rejected Claims 1-7 and 47 based on 35 U.S.C. § 102. In support of this rejection, the Examiner stated:

"6. Claims 1-7 and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Medsker (US 3,671,208). Regarding claims 1, it is Examiner's position that Medsker ('208) discloses a system comprising a duct (11/30) defining an interior passageway; a wing (13/33) in the duct the wing arced between the leading edge 916/33) and a trailing edge (17/34)(see Figs. 1 and 3; col. 3, lines 1-5 and 40-46); and a nozzle (see dashed lines in Fig. 1, col. 3, lines 5-18) disposed within the interior passageway of the duct. Regarding claim 2, the nozzle is disposed adjacent the trailing edge of the wing beyond the wing (see Fig. 1). Regarding claim 3, the wing is capable of generating lift (see shape of wings in Figs. 1 and 3). Regarding claim 4, the wing is configured to shed a vortex (15) at a point on the trailing edge of the wing. Regarding claim 5, the nozzle is positioned adjacent a first end of the trailing edge of the wing where the vortex is shed (see Figs. 1-4). Regarding claim 6, the wing is suspended within the interior passageway (See Figs. 1-11). Regarding claim 7, the wing is attached to the inner surface of the duct and extends into the interior passage of the duct (see Figs 1-11). Regarding claim 47, Medsker ('208) discloses a plurality of wings within the interior passage of the duct, each of the plurality of wings arced between a leading edge and a trailing edge (see embodiment of 6, 10 and 11).

7. Claims 1-7 and 47 are rejected under 35 U.S.C. § 102(B) as being anticipated by Holzbauer (US 4,079,718). Regarding claim 1, Holzbaur ('718) discloses a system comprising a duct (1) defining an interior passageway; a wing (any or 2, 4, 5, 14, 15, 22 or 25) in the duct the wing arced between the leading edge and a trailing edge (see Figs. 1-5); and a nozzle (12) disposed within the interior passageway of the duct. Regarding claim 2, the nozzle is disposed adjacent the trailing edge of the wing

beyond the wing (see Fig. 1-5). Regarding claim 3, the wing is capable of generating lift (see shape of wings in Figs. 1-5). Regarding claim 4, the wing is configured to shed a vortex at a point on the trailing edge of the wing (see Figs. 1-5). Regarding claim 5, the nozzle is positioned adjacent a first end of the trailing edge of the wing where the vortex is shed (see Figs. 1-5). Regarding claim 6, the wing is suspended within the interior passageway (see Figs. 1-5). Regarding claim 7, the wing is attached to the inner surface of the duct and extends into the interior passage of the duct (see Figs. 1-5). Regarding claim 47, Holzbaur ('718) discloses a plurality of wings within the interior passage of the duct, each of the plurality of wings arced between the leading edge and a trailing edge (see Fig. 5)."

The Examiner rejected Applicant's claims under 35 USC § 102(b) as being unpatentable based on Medsker and Holzbauer. Applicant has carefully reviewed these references and provides newly-added independent claim 49 which provides elements that are not disclosed in the Medsker or Holzbauer references. Specifically, newly-added independent claim 49 is directed to a gas stream vortex mixing system for mixing a gas stream that includes a duct provided with an inner surface defining a passageway for communicating a gas stream and a wing.

The wing includes a first end, a second end, an upper surface and a lower surface and a uniform thickness between the upper and lower surfaces extending from the first to the second ends of the wing. The wing is non-moveably coupled within the passageway of the duct and configured to shed a vortex at an end of the second end of the wing. Claim 49 further includes a nozzle to discharge a mixture into the passageway where the nozzle is located adjacent the edge of the second end of the wing. The nozzle is positioned to discharge the mixture into

the vortex at a point where the vortex is shed by the edge of the second end of the wing.

A wing having uniform thickness provides the advantages of an air foil, while providing a solution that is simple, low-cost and rugged. Applicant respectfully submits that neither the Medsker or Holzbauer reference, either alone or in combination, teach, disclose or even suggest the novel aspects of claim 49. Specifically, the cited references do not disclose, teach or suggest, among other elements, a wing having a uniform thickness between the upper and lower surfaces extending from the first to the second ends of the wing that is non-moveably coupled within the passageway of the duct. Furthermore, the references fail to disclose a nozzle to discharge a mixture located adjacent the second end of the wing to discharge the mixture at a point where the vortex is shed by the edge of the second end of the wing.

The Holzbauer reference illustrates a moveable, pivoting air measuring valve (see Figure 1) provided with a fuel injection nozzle centrally located about the back middle of the air measuring valve. (See Figure 7). The Medsker reference illustrates a metering conduit for metering a second fluid as illustrated by the arrow 23 into the first fluid at the beginning of the vortex 15. (Medsker col. 3, lines 7-9) Thus, the second fluid is introduced a considerable distance downstream away from the mixing member 13, which fails to teach, disclose or suggest, among other things, placement of the nozzle located adjacent the edge of the second end of the wing such that the nozzle discharges the mixture into the vortex at a point where the vortex is shed by the edge of the second end of the wing, as provided in Applicant's claim 49. Applicant's

newly-added dependent claims 50-57 provide additional elements that are neither taught, disclosed or suggested by the references cited by the Examiner. For this reason, Applicant respectfully submits that newly-added claims 49-57 are allowable, and Applicant earnestly seeks such allowance.

Applicant's newly-added independent claim 58 provides a gas stream vortex mixing system including a duct provided with an inner surface defining a passageway for communicating a gas stream. The claim 58 further provides a first and second wing configured to shed a vortex at an edge of the second end of the first and second wings. The first and second wings are non-moveably coupled within the passageway of the duct such that the first ends of the first and second wings are positioned along a plane within the passageway of the duct, wherein the plane is substantially perpendicular to a direction of travel of the gas stream through the passageway.

Applicant's claim 58 further provides for a first and second nozzle for discharging a mixture into the passageway, where the first and second nozzles are located adjacent the edges of the second ends of the first and second wings such that the nozzles discharge the mixture into the vortex at a point on the first and second wings, respectively, where the vortex is shed by the edges of the second ends of the first and second wings. Applicant respectfully submits that the Medsker and Holzbauer references, either alone or in combination, fail to teach, disclose or suggest the unique invention as claimed in Applicant's newly-added claim 58.

Applicant's newly-added dependent claims 59-67, which depend from independent claim 58, provide additional elements

that are not disclosed in these cited references. Applicant's claims 62 and 63 provide for a third and fourth wings and third and fourth nozzles to further promote additional mixing of the mixture with the gas stream through the passageway. Furthermore, Applicant's newly-added dependent claim 64 provides for the duct to include a plurality of walls wherein the first and second wings are non-moveably coupled to an opposing first and second walls, respectively, within the duct and further provides for placement of the third and fourth wings non-moveably coupled to an opposing third and fourth walls, respectively, within the duct such that the first ends of the first, second, third and fourth wings are located along the same plane in the passageway of the duct.

The location and disposition of the wings in the duct in this manner provides for effective mixing of the fluids, while considering the detrimental effects of reduced airflow or drag. Applicant respectfully submits that these novel aspects of Applicant's invention are neither taught, disclosed or suggested by the cited references. For this reason, Applicant respectfully submits that newly-added claims 58-67 are allowable and Applicant earnestly seeks such allowance.

Applicant's newly-added independent claim 68 is directed to a vortex mixing system for mixing a combustion gas exhaust that includes a combustion exhaust duct provided with a passageway for communicating a combustion gas exhaust, the system having a first and second wings non-moveably coupled within the passageway of the combustion exhaust duct. Claim 68 further includes a first and second nozzle to discharge a mixture into the passageway positioned to discharge the mixture in a

direction opposite the direction of travel of the combustion gas exhaust through the passageway.

Effective distribution of the mixture may be obtained by placement of the nozzles and resulting dispersion of the mixture in this manner. Applicant respectfully submits that this, as well as other aspects of Applicant's claim 68, are not taught, disclosed or suggested by the references cited by the Examiner. For this reason, Applicant submits that newly-added independent claim 68 is allowable.

**CLAIM REJECTION BASED ON 35 USC § 103**

In the Office Action mailed October 7, 2002, Examiner rejected Claims 8-9, 10-17, 20-24, 43-46 and 48 under 35 U.S.C. 103. In support of Examiner's rejection, Examiner stated:

"9. Claims 8, 9, 10-17, 20-24, 43-46 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medsker (US 3,671,208). Regarding claim 8, 45 and 46, Medsker ('208) discloses a system comprising a duct (11/30) defining an interior passageway; a wing (13/33) in the duct the wing arced between a leading edge (16/33) and a trailing edge (17/34) (see Figs. 1 and 3; col. 3, lines 1-5 and 40-46); and a nozzle (see dashed lines in Fig. 1; col. 3, lines 5-18) disposed within the interior passageway of the duct. Medsker ('208) fails to disclose a numerical value for the angle of the wing; however, such an angle is recognized as a parameter to be selected (see col. 2, lines 8-13; col. 3, lines 46-50; Fig. 1). Therefore, as held in *In re Aller*, 105 USPQ 233,235 (CCPA 1955), 'where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges through routine experimentation. Regarding claim 9, the wing is capable of generating lift (see shape of wings in Figs. 1 and 3). Regarding claim 11, the wing is a cambered wing (see Figs. 1 and 3). Regarding claim 12, the wing is a substantially arcuate airfoil (see Figs. 1 and 3a). Regarding claim 13, the wing is a cambered wing having a chord line defined as a substantially straight

line extending from the leading to trailing edge and chamber line defined as a substantially arced line extending from the leading to trailing edge (see Fig. 1). Regarding claims 14 and 15, it is considered that it would have been obvious to one of ordinary skill in the art to have made the wing of rigid material such as sheet metal to withstand the force of gas flow. Regarding claim 16, the wing is an airfoil with a camber line arced from the leading to trailing edge of the airfoil (see Fig. 1). Precise consideration of claims 17, 20-22 due to their self-contradictory nature discussed above with regard to section 112. Regarding claim 17, the airfoil being substantially parallel to the duct is depicted in Fig. 3. Regarding claim 20, the airfoil is operable to shed a vortex at a point on the trailing edge of the airfoil (see Figs. 1 and 3). Regarding claim 21, the nozzle is positioned adjacent the point of shedding (see Fig. ). Regarding claims 22 and 24, the disclosed system of Fig. 1 is capable of operating in both the claimed manners. In the intended use described by the referenced the material from the nozzle flows away from the wing. Regarding claim 23, at least one nozzle is positioned adjacent a point on the wing where the vortex is shed (see Fig. 1). Regarding claim 43, the wing is arced between a leading edge (16, 33) and a trailing edge (17, 34) along and upper surface 918/35) of the wing. Regarding claim 44, the wing is arced between a leading edge (16) and a trailing edge (17) along both upper and lower surfaces of the wing (see Fig. 1). Regarding claim 48, a plurality of wings are disposed in spaced apart relationship in the duct (see embodiments of Figs. 6, 10 and 11)."

10. Claims 8, 9, 10-17, 20-24, 43-46 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzbaur ('718). Regarding claim 8, 45 and 46, Holzbaur ('718) discloses a system comprising a duct (1) defining an interior passageway; a wing (any or 2, 4, 5, 14, 15, 22 or 25) in the duct the wing arced between a leading edge and a trailing edge (Figs. 1-5); and a nozzle (12) disposed within the interior passageway of the duct. Holzbaur ('718) fails to disclose a numerical value for the angle of the wing; however, such an angle is intended to be adjusted (see col. 6 line 30 to col. 7 line 5; Figs. 1-5 and 8).



Therefore, as held in *In re Aller*, 105 USPQ 233,235 (CCPA 1955), 'where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges through routine experimentation'. Regarding claim 9, the wing is capable of generating lift (see abstract, Figs. -5). Regarding claim 11, the wing is a cambered wing (see Figs. 1-5). Regarding claim 12, the wing is a substantially arcuate airfoil (see abstract, Figs. 1-5). Regarding claim 13, the wing is a cambered wing having a chord line defined as a substantially straight line extending from the leading to trailing edge and chamber line defined as a substantially arced line extending from the leading to trailing edge (see Figs. 1-5). Regarding claims 14 and 15, it is considered that it would have been obvious to one of ordinary skill in the art to have made the wing of rigid material such as sheet metal to withstand the force of gas flow. Regarding claim 16, the wing is an airfoil with a camber line arced from the leading to trailing edge of the airfoil (see Fig. 1-5). Regarding claims 17, 20-22 and 24, precise consideration of claims 17, 20-22 and 24 due to their self-contradictory nature discussed above with regard to section 112. Regarding claim 17, the airfoil being substantially parallel to the duct is depicted in Fig. 2 and (in dashed lines) in Fig. 1, for example. Regarding claim 20, the airfoil is operable to shed a vortex at a point on the trailing edge of the airfoil (see Figs. -5). Regarding claim 21, the nozzle is positioned adjacent the point of shedding (see Fig. 1-5). Regarding claims 22 and 24, the disclosed system of Figs. 1-5 is capable of operating in both the claimed manners. Regarding claims 23, at least one nozzle is positioned adjacent a point on the wing where the vortex is shed (see Fig. 1-5). Regarding claim 43, the wing is arced between a leading edge and a trailing edge along and upper surface of the wing (see Figs. 1-5). Regarding claim 44, the wing is arced between a leading edge and a trailing edge along both upper and lower surfaces of the wing (see Figs. 1-5). Regarding claim 48, a plurality of wings are disposed in spaced apart relationship in the duct (see Fig. 5)."

Applicant has cancelled claims 8, 9, 10-17, 20-24, 43-46 and 48 obviating the Examiner's rejection of these claims.

Applicant respectfully submits, however, that newly-added independent claims 49, 58 and 68 provide additional non-obvious aspects that the Holzbauer and Medsker reference, as well as the other references cited by the Examiner, fail to teach, disclose or even suggest. For the reasons stated above, which are incorporated herein by reference, Applicant seeks allowance of newly-added claims 49-68.

#### **CONCLUSION**

For all the reasons mentioned herein, Applicant respectfully requests reconsideration. Applicant submits that the Application and claims 49-68 now pending are in condition for allowance, and Applicant earnestly seeks such full allowance. Should the Examiner have any questions, comments, or suggestions in furtherance of the prosecution of this Application, please contact the undersigned by telephone at 214.979.3093. Applicant, through his attorney, stands ready to conduct a telephone interview with the Examiner to review this Application, if the Examiner believes that such an interview would assist in the advancement of this Application.

To the extent that any further fees are required during the pendency of this Application, including petition fees, the Commissioner is hereby authorized to charge payment of any additional fees, including, without limitation, any fees under 37 C.F.R. § 1.16 or 37 C.F.R. § 1.17, to Deposit Account No. 23-3189 of Hunton & Williams (Dallas) and reference Attorney Docket No. 82274.472023. In the event that any additional time is needed for this filing, or any additional time in excess of that

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requested in a petition for an extension of time, please consider this a petition for an extension of time for any needed extension of time pursuant to 37 C.F.R. § 1.136 or any other section or provision of Title 37. Applicant respectfully requests that the Commissioner grant any such petition and authorize the Commissioner to charge the Deposit Account referenced above. Please credit any overpayments to this same Deposit Account.

Respectfully submitted,



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